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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,219	12/01/2003	Soon Bog Kwon	2832-0166P	9828
2292	7590	08/01/2005	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			LAM, CATHY FONG FONG	
			ART UNIT	PAPER NUMBER
			1775	

DATE MAILED: 08/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/724,219

Applicant(s)

KWON ET AL.

Examiner

Cathy Lam

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) 7-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4-6 and 13 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

In view of the amendment and remarks filed on May 09, 2005, the pending claims are continued to be unpatentable. The art rejection in the previous office action has been withdrawn and the product claims are under a new ground of rejection.

In respond to applicant's traversal to the restriction requirement, the method claims involves with heating the barrier layer and the tin layer, this step would require a further search and is burdensome to the examiner. Therefore, the method claims (ie. 7-12) are withdrawn for the time being. These claims however may be rejoined upon the product claims being allowable and under the condition that the process claims are fully commensurate in scope with the product.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 & 13 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Melton et al (US 5390080).

Melton discloses a printed circuit board having a connection site. The printed circuit board (12) is comprised of substrate and a copper pattern (14). A solder stop (19) (or a solder resist) is coated onto the copper pattern (14) except an area over which a solder is to be applied (col 2 L 63-65).

An alloy layer (24) (or barrier layer) that includes voids is coated onto the area not covered by the solder stop (col 4 L 12-15). The examiner takes the position that the

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materials used for this alloy layer can be chosen depending upon the void volume desired.

A solder layer (26) that includes tin and zinc, is formed over the alloy layer (24) (col 4 L 46-48). The solder layer is heated above the melting point of the tin-zinc alloy (26) to cause the solder melt and coalesce that wets the barrier layer (24) and the copper conductive area (col 3 L 48-51).

***Claim Rejections - 35 USC § 103***

3. Claims 1 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melton et al (US 5390080).

Melton teaches the present invention but is silent about the pore density of the alloy layer (24) (or barrier layer), nor does it teach the specific thicknesses for the barrier layer and the tin layer as claimed by the applicant.

Melton teaches the concept of the present invention, that is a solder resist covering a copper pattern leaving only a bonding area, a barrier layer and a solder layer. The barrier layer is composed of a material according to one's desire, it could either be a void containing layer (ie. porous) or a non-void containing layer.

In view of Melton's teaching, it would have been obvious to choose a desired thickness for the barrier layer and the tin layer because it is a matter of design choice.

***Allowable Subject Matter***

4. Claims 2-3 are objected to as being dependent upon a rejected base claim, but would be allowable if incorporate into all the independent claims.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Cathy Lam  
Primary Examiner  
Art Unit 1775

cfl  
July 27, 2005